

## Property of Diamond Coated Tools for Lapping Single-Crystal Sapphire Wafer

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**Abstract :** Diamond coatings were prepared on cemented carbide by hot filament chemical vapor deposition (HFCVD) method. Lapping experiment of single-crystal sapphire wafer was carried out using the prepared diamond coated tools. The diamond coatings and machined surface of the sapphire wafer were evaluated by SEM, laser confocal microscope and Raman spectrum. The results indicate that the lapping sapphire chips are small irregular debris and long thread-like debris. There is graphitization of diamond crystal during the lapping process. A low surface roughness can be obtained using a spherical grain diamond coated tool.

**Keywords :** lapping, nano-micro crystalline diamond coating, Raman spectrum, sapphire

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